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AUTHOR	Dowaliby, Fred J.; Pagano, Jo Anne
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ABSTRACT

The authors review research on locus of control (LOC), particularly as it pertains to the instruction of hearing impaired students. According to social learning theory, the LOC construct is explained to theorize that two distinctly different types of persons may be identified--"internals" who assume responsibility for their activities and "externals" who are likely to ascribe the consequences of their behavior to forces outside their influence. Studies addressing specific research questions are organized under seven categories--dimensionality, correlates, instruction, deafness, disabilities, changeability, and ammendments and contributions of attribution theory. Among the findings noted are the following: when we account for situational and affective features contributing to a person's LOC, a pipolar, unidimensional construct with "internality" and "externality" comprising the extremes emerges; hearing impaired learners are relatively external in their LOC orientation as compared with hearing counterparts; specific experiences of short duration can produce predictable shifts in control orientation in either direction along the LOC continuum; and externality is related to poorer achievement and less effective study habits and attitudes. Appended is a paper by J. Porter titled "The Foundation Series--An Internal Review of the Dowaliby and Pegano Paper." (SB)

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LOCUS OF CONTROL: REVIEW AND IMPLICATIONS FOR INSTRUCTION OF THE HEARING-IMPAIRED

Paper Series No. 39
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Fred J. Dowaliby
Jo Anne Pagano

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NTID's principal goal in doing research is to influence the education, training and career placement of deaf citizens through systematic examination of issues related to deafness. As one part of NTID's total research effort, the Department of Research and Development conducts descriptive and experimental research. Research findings are used in the development of programs and materials in the areas of learning and instruction, personal and social growth, and career development of deaf students. This document was developed in the course of an agreement with the U.S. Department of Health, Education and Welfare.

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Abstract

Studies are reviewed which directly pertain to perceived locus of control (LOC) and instruction drawing implications for the hearing-impaired. Grounded in social learning theory, the locus of control construct theorizes that essentially two distinctly different types of persons may be identified. "Internals" assume responsibility for their activities, while "externals" are likely to ascribe the consequences of their behavior to forces outside their influence. A great deal of relevant research has been performed with normally-hearing students. Unfortunately, very little has been performed with hearing-impaired subjects. The authors believe, however, that the applicability of these previous findings will be empirically substantiated by research with hearing-impaired subjects.

Studies reviewed are organized according to a seven-category system which evolved as the review progressed. The first two, "dimensionality" and "correlates," provide a review and discussion of these definitional features. The findings indicate that when we account for situational and affective features contributing to a person's LOC, a bipolar, unidimensional construct with "internality" and "externality" comprising the extremes emerges. The correlational studies indicate that externals are more likely to experience delilitating anxiety reactions, be field dependent, and be lower in mental ability, verbal ability and efficiency, while internals tend to excel in these areas.

A number of studies are reviewed which examine LOC and various aspects of instruction. Overall, internals outperform externals. However, more complex aptitude x treatment interaction studies reveal that a person-environment fit more precisely accounts for the findings. These studies repeatedly show that congruence of the learner's LOC and certain structural aspects of the instructional situation are critical. Internals

demonstrate greater satisfaction and learning from instructional situations that are low in structure, discipline, and/or teacher control. Similarly, externals maximize their performance in highly structured and controlled environments.

The few studies found which employed hearing-impaired subjects suggest that hearing-impaired learners are relatively external in their LOC orientation as compared with hearing counterparts. Other studies of the disabled are consistent with this finding. The implications for the hearing-impaired are clear in view of the correlational and instructional findings.

A major section of the paper focuses on "changeability." The findings indicate that specific experiences of short duration can produce predictable shifts in control orientation in either direction along the LOC continuum.

Amendments and contributions of attribution theory to social learning theory are then reviewed and discussed. Where LOC, as formulated by social learning theory, refers to a relatively stable dispositional characteristic of individuals, attribution theory suggests and demonstrates that certain situational and affective characteristics interact with and modify a person's relatively stable control predisposition.

These findings suggest the need for the scientific investigation of various aspects of LOC at NTID. Such an endeavor should include, but not be limited to, each of the seven categories of studies reviewed, with special emphasis on instruction and changeability. In addition to and consistent with attribution theory, situational features should be less variant within NTID and hence present fewer local operational problems. Thus, we might employ basic math instruction as the content vehicle for programs of changeability. The results of such training programs would be more likely to transfer and generalize since math pervades most areas of study.

Findings are also discussed in terms of accommodating versus changing individual's LOC. It is suggested that an optimal level of accommodation might produce desirable immediate instructional outcomes and also promote a longer-term, desirable shift in LOC.

Background and Introduction

Locus of control (LOC) first emerged as a psychological construct within the context of social learning theory in the early 1960's. Since then, a vast number of empirical studies, position papers, and literature reviews have been performed. As a result, a great deal is known about LOC.

Julian B. Rotter and colleagues originally formulated the psychological construct and related theory which states that self-perceived locus of control distributes such that two distinctly different types of persons may be identified. "Internals' are those who ascribe the consequences of their activities to their own behaviors and hence assume responsibility for them. Their perceived locus of control is thus internal in the sense that they believe there is a causal relationship between their own behaviors and associated consequences. It follows that internals believe that they can change (or control) their rewards and punishments by appropriately changing their own behaviors.

"Externals," on the other hand, ascribe the consequences of their behavior to forces outside of themselves, i.e., beyond their influence. Fate, luck, and powerful others are examples of such outside forces which represent external loci of control. Individuals holding such a view of the world are not aware of or do not recognize the causal link between their behaviors and the consequences thereof.

While the research is suggestive, unfortunately the relevance of LOC to the instruction of the hearing-impaired is only now beginning to receive attention. The authors are confident, however, in the generalizability of the findings derived from studies using normally hearing subjects to NTID and other hearing-impaired student populations. But, arguments to this effect will have to be supported by empirical evidence beyond that provided by the studies reported herein.

This review was motivated by the results of a survey of NTID faculty which suggested, among other things, that faculty perceive their students as being relatively externally oriented in comparison with other student populations. The implication was that this relatively external orientation is at least partially responsible for some of the unique difficulties of hearing-impaired students. Should this suspicion be confirmed by the research literature and by our own investigation, we shall be on the road to devising more productive ways of managing our students' experiences here at NTID.

Procedures and Organization

Two computer searches were performed yielding a bibliography of the most recently published 125 titles and abstracts relevant to our purpose. Of these, approximately 60 were procured and read in detail. Reiterative examinations of these and other studies and cited references resulted in the final reading of approximately 180 primary and secondary publications. Fifty eight of these are explicitly cited in detail in this review.

Clearly, this review is not intended as a comprehensive discussion of the area. Rather, articles were scrutinized and selected on the basis of our perception that they pertained most directly to instruction of the hearing-impaired.

The studies included in this paper are organized according to a seven-category system which was developed and refined as reading and analysis progressed. The first two categories, "Dimensionality" and "Correlates," are positioned at the start of the paper so as to provide the reader with the conceptual background necessary to understanding specific research questions. Studies addressing specific research questions are organized under the following categories: "Instruction," "Deafness," "Disabilities," and "Changeability." Prior to the final section dealing with the implications of LOC research for our own work at NTID is a section in which we discuss the contributions of attribution theory to a more elaborate and refined conceptualization of the construct.

Dimensionality

Most of the studies which have focused on the dimensionality of the LOC construct have factor analyzed some version of the Rotter Scale (Rotter, 1966). The model for all of these studies is an investigation reported by Mirels (1970) who factor analyzed the 23 Rotter Scale items administered to over 300 college students. This analysis yielded two orthogonal factors, and these were the same for males and females. The first factor stressed "importance of ability and hard work," and the second, while equally reflective of personal responsibility, was interpreted as a measure of belief in personal "political efficacy." This separation of control over personal events and control over public events was deemed an advance in clarity.

Two replications of Mirels' factor analysis were reported by Viney (1974). In these studies, Australian students were used and, despite slightly different labels for the two factors, similar factor patterns were discovered. Factor I in these studies was labeled "personal responsibility" and Factor II was conceptualized as "social responsibility." Obviously, these labels conform to the Mirels distinction between "ability and hard work" and "political efficacy" in that these factors suggest a boundary between public and private control.

Abrahamson, Schludermann and Schludermann (1973) provided another replication of Mirels' findings. This study was executed on a Canadian sample and revealed still a third factor, "control over one's likeability," which seems to represent an intermediate stage between public and private events.

Joe and Jahn (1973) hypothesized the restricted range of responses produced by the original forced-choice format of the Rotter Scale yielded an artifactual conclusion of unidimensionality. As an alternative, these researchers devised a Likert-type version of

the scale and administered it to 288 psychology students. Consistent with Mirels' findings, the personal and political factors were revealed, and there was no difference between males and females. As was the case in the Australian study, the labels here were also reconceptualized so that factor I become "primary determinants of success" and factor II "political efficacy". We may conclude that these are essentially the same factors as those adduced by Mirels, Viney, and Abrahamson et al.

Kearney and Kearney (1977) also factor analyzed the Rotter Scale. Their analysis was consistent with the Rotter assumptions of "luck" and "powerful others" as salient categories. However, among the female members of the sample, "powerful others" was discovered to comprise three subconcepts: 1) ability to influence political persons and events; 2) ability to become a powerful other; and 3) ability to deal with criticism when tendered by authority figures. Once again, we see a distinction between personal and public control.

Three factors also emerged in analyses performed by Kleiber, Veldman, and Menacker (1973). In a procedure similar to that employed by Joe and Jahn the 23 forced-choice items of the Rotter Scale were converted to 46 4-point Likert-type items. These items were randomly reordered and interspersed with 40 filler items. Once again three factors emerged: 1) luck and chance; 2) externality; and 3) internality.

Using another Likert-type conversion of the Rotter Scale, Collins (1974) identified four factors. These four factors were defined in terms of dominant world perception and reflected 1) difficulty vs. ease; 2) justice vs. injustice; 3) predictability vs. unpredictability; and 4) political responsiveness vs. unresponsiveness.

The personal and political control dichotomies found by these studies were employed by Ramaniah, Ribich and Schmeck (1975) to compare internals and externals with respect to performance on the Survey of Study Habits and Attitudes (Brown and Holtzmann, 1967).

When the dimension of interest was the personal control scale, internals were found to have more effective study habits; however, when the political control scale was scrutinized, there appeared to be no difference between externals and internals. This anomaly supports the hypothesis of multidimensionality since, if LOC did reflect a single bipolar characteristic, we should expect this internal-external difference to appear across scales. It seems clear that the more fruitful speculation is that LOC probably reflects a constellation of reasonably independent dispositions and attitudes.

The most compelling conclusion suggested by dimensionality research is that LOC dimensions are situation or domain-specific and that certain situational demands may elicit responses peculiar to that situation. However, before we conclude that the next step is to attempt to map a typology of situations according to their internal-external position, we should note some limitations of the investigative techniques used. All of these studies employed some form of the Rotter 23-item scale. The resulting observed factors, therefore, will necessarily be limited to the content expressed by those items. Given that fact, it is not surprising that five of the studies surveyed reported a "powerful others" factor since this factor is implicit in certain items. The difficulty lies in the possibility that no items tap other equally important dimensions. This constraining nature of the techniques employed when viewed jointly with the subjective nature of factor selection and interpretation recommends a conservative summative approach.

The common finding among all of the reported studies is that whatever labelling and other methodological and conceptual devices were employed, individuals were noted to be characterizable according to whether their orientation to causal explanation tends toward the taking of personal responsibility or to the displacement of responsibility on to one or more external causes.

The situational character of LOC alluded to will be discussed in the section on attribution theory. First, however, we will examine particular applications of the construct vis-a-vis the interaction of LOC with other cognitive and affective characteristics under specified instructional and task conditions.

Correlates

Studies which report relationships between other measures and LOC are included under this heading. This summary will not include such commonly reported pervasive effects as sex (males more internal than females) and age (LOC shifts toward internality with increased age). We will discuss only those psychological and performance correlates directly related to various aspects of instruction.

Among dispositional characteristics investigated, "trait anxiety" has been shown to be consistently related to LOC. Lichtenstein and Keutzer (1967), for example, administered Rotter's I-E Scale and the IPAT Anxiety Scale to a large group of adults in the course of a smoking control research program. A simple correlation of .41 between the I-E and IPAT Scales was observed, indicating externals to be more prone than internals to debilitating anxious reactions to situations.

Hountras and Scharf (1970) reported consistent findings. Sixty low-achieving freshman males were administered Rotter's I-E Scale and the Taylor Manifest Anxiety Scale. Again, results suggested that externals were higher than internals in trait anxiety.

This same relationship has been demonstrated in the case of state anxiety by Weiner and Potepan (1970), who found that successful students were relatively internal and had low test anxiety.

Certain cognitive dispositions and abilities have also been demonstrated to be related to LOC. Two studies examined the relationship between LOC and field-

dependence. Lefcourt and Telegdi (1971) employed the rod-and-frame measure of field-dependence and the Rotter I-E Scale as independent variables. Significant interactions were obtained on two measures of verbal productivity and two measures of cognitive activity. As was expected, internal field-independent subjects scored highest on all measures. The converse expectation, that external, field-dependent subjects would score lowest of all, was not supported. Rather, the theoretically incongruent groups (external/field-independent and internal/field-dependent) scored lowest on each measure of "cognitive activity." This finding is reminiscent of the aptitude-by-treatment interaction (ATI)[1] studies reported in the section on instruction and indicates the complex nature of LOC.

Chance and Goldstein (1971) tested male and female subjects with a series of 68 embedded figures. Short disembedding time on this test indicates field-independence, and longer discovery times indicate field-dependence. Results indicated that while all subjects improved with practice, internals' disembedding times decreased the most, suggesting that internals will have an easier time mastering tasks that require a field-independent style.

Another set of studies focused on "mental or verbal ability." Powell and Centa (1972) investigated the hypothesis that internal LOC is associated with greater mental ability. Twenty-three undergraduates were administered Rotter's I-E Scale, the Henman-Nelson Tests of Mental Ability (College Level), and the Adult Locus of Control (ALOC) Scales. Results were intepreted as suggesting significant although modest relationships between each of the LOC scales (which intercorrelated at -.51) and the Mental Ability Scale.

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[1] An ATI exists whenever the relationship between one or more aptitude and one or more instructional outcome varies with different methods of instruction (see Berliner and Cahen, 1973).

Brecher and Denmark (1969) reported similar conclusions. Eighty-four female subjects were administered Rotter's I-E Scale and Thurstone's word fluency test. As expected, mean fluency scores of internals were significantly higher.

In a related study, Penk (1969) reported findings which demonstrate such a relationship between level of verbal abstraction and degree of internality. Bialer's I-E Scale and nine experimental tasks, including inkblots, word association, object sorting, category width preference, etc. were administered to small groups of children. Results indicated that internals were higher on vocabulary, object sorting, McGaughran's open-public sortings, and Rappaport's functional sortings. In addition, internals showed quicker reaction time for word associates and a facility for Moran's object-referent word associates.

Finally, a set of findings have been reported which suggest a relationship with mental efficiency. Gozali, Cleary, and Gozali (1973) hypothesized that internals use specific identifiable test-taking strategies which result in higher achievement. A large group of university students were administered Rotter's I-E Scale and a verbal ability test constructed from ETS' item pool, with test items ordered for difficulty. This verbal ability test was administered and recorded by computer, allowing the use of response latency or "time on item" as a dependent measure. As expected, internals but not externals used time in a way systematically related to item difficulty.

Prociuk and Breen (1974) reported consistent findings. College students were administered the Levenson Internal, Powerful Others, and Chance Scales and the Brown-Holtzmann Survey of Study Habits and Attitudes. The two external scales, the Powerful Others and the Chance Scales, were both related to ineffective study habits and attitudes.

Another study, DuCette, Wolk, and Friedman (1972), hypothesized that internals are more active and efficient in both using information and in creativity. The IAR and the

Pattern Meanings Test were administered to 40 lower-class males. Consistent with findings of other studies, results indicated greater creativity and creative efficiency for internals.

The studies reviewed have yielded theoretically consistent findings. It has been shown that externals are more likely to have debilitating anxiety reactions, be field-dependent, be lower in mental ability, verbal ability, and efficiency, and have less effective study habits and attitudes while internals tend to relatively excel in all of these areas.

We will turn now to studies which have shown how LOC, either singly or in interaction with other characteristics , acts as a determinant of performance quality in various contexts and under a variety of task and instructional conditions.

Instruction

The relationship between LOC and various instructional outcomes has been examined in several studies. There is clear evidence that LOC is an important instructionally-relevant variable which operates differently within various social, psychological, and environmental contexts.

Shaw and Uhl (1971) studied possible relationships between children's LOC and reading scores for lower and upper-middle socio-economic status (SES) white and black groups. Locus of Control related to reading ability only among white upper-middle SES children. In other words, only among this group was it the case that externals were poorer readers than internals. The authors speculated that a possible reason for this finding was that different operative values for reading across SES groups may have produced differential expectations for reading success. It has been demonstrated in a number of instructional areas that expectation for success does exert a strong influence on

successful achievement, and so it may be that this relationship is responsible for the qualified relationship between LOC and reading ability noted by Shaw and Uhl. When we come to our discussion of attribution theory, we will show how expectation of success relates to the notions of internality and externality in a reciprocally causal manner.

Messer (1972) investigated LOC and general academic achievement among children. School grades and tests of academic achievement were compared with LOC in this study. It was found that internals had higher grades and achievement test scores. This relationship held even when IQ and cognitive impulsivity were controlled. Such a finding demonstrates that LOC is not related to either impulsivity or IQ and is consistent with the Shaw and Uhl (1971) qualification regarding the predictive validity of LOC. This finding also indicates that LOC is an independent determinant of achievement.

Nord, Connelly, and Daignault (1974) performed a similar investigation with entering MBA students. An admissions test for graduate study in business and Rotter's I-E Scale were administered, and data on course grades, LOC and the admissions test were collected. Results were interpreted as demonstrating that the admissions exam was unrelated to LOC. However, both LOC and performance on the admissions exam were related to course performance. Moreover, the results showed differential predictive utility of these measures, depending on the course. This observed difference allows an inference of the presence of latent aptitude-treatment interactions (ATIs).[1] And, in fact, several studies have been reported which have investigated ATIs involving LOC.

Arlin (1975) studied the interactive effect of task and class structure and LOC on pupil attitudes. On a student attitude questionnaire, internals tended to favor open, low-structure teaching environments and when provided with such an environment, expressed more positive attitudes to the instructional experience. When the instructional experience occurred within a traditionally structured environment, there was no difference between internals and externals.

Parent, Forward, Canter and Mohling (1975) reported similar findings. College students were administered Rotter's I-E Scale, then engaged in a 2-hour minicourse on computer programming taught in one of two ways. The condition defined as "high discipline" provided a great deal of external structure, while the "low discipline" condition allowed self-pacing and imposed no rules. The differential effects of these two conditions between LOC groups were as expected: internals performed better under the low discipline condition, and externals demonstrated greater achievement under high teacher discipline conditions.

Another similar study is reported by Rich and Bush (1978). College students were classified as internals or externals according to Rotter's I-E Scale. Students evaluated high and low faculty-control instructional styles by completing a questionnaire following each class session. High control was defined in terms of lecturing, directing, or providing information, and low control in terms of student verbal or physical participation, either independently or student-to-student. As the authors hypothesized, students in instructional conditions congruent with their own LOC style (i.e., external students/high control and internal students/low control) made more positive evaluations than students in situations judged incongruent with their own styles (external students/low control and internal students/high control).

Finally, conclusions reached by Allen, Giat, and Cherney (1974) lend additional support to the congruence position. Subjects were 51 females and 37 males in a college PSI (personalized system of instruction) course. The format allowed students to control pacing and selection of areas of instructional materials. LOC and trait anxiety were assessed during the first class, and state anxiety immediately before oral exams. From the results, the researchers concluded that internal LOC students learned more effici-

ently, were less anxious during oral assessments, and performed higher on a written final exam than external counterparts.

The studies reviewed point directly to the relevance of the LOC construct to instruction. Three focused on the predictability of academic achievement from LOC. Reliable relationships were indicated by all three, with internals consistently outperforming externals. The ATI studies extend this basic finding to demonstrate that congruence of the learner's LOC and certain structural aspects of the instructional situation are important. For example, it was found that internals rated most highly and learned more in instructional situations which were low in either structure, discipline, or faculty control. Similarly, externals, who prefer a great deal of structure, maximize their performance potentialities in highly structured and controlled environments.

The studies which we have examined so far dealt with relatively homogeneous mainstream populations. But LOC has also been found to be a salient explanatory construct for the achievement related behaviors of special student populations as the following studies demonstrate.

Deafness

Studies relating deafness to LOC primarily demonstrate that the relatively impoverished linguistic experience of deaf students is directly connected both to a demonstrated external orientation and to perceived performance deficits. Three studies are reviewed which pertain directly to deafness and LOC.

Bodner (1976) assessed LOC among 228 deaf students, categorized as either "young" or "adult." It was previously noted that behavioral correlates of externality in a hearing sample approximated the life conditions of the linguistically-isolated deaf who are, in fact as well as in belief, dependent on the external world. The mean ages for the young and

adult groups, respectively, were 11.4 and 20.3, with 84 classified as "young" and 144 as "adults." A total communication version of the Bialer-Cromwell Children's Locus of Control Scale was administered via videotape. Preliminary psychometric analyses resulted in the conclusion that the instrument had unacceptable validity for the young group and low reliability for the adult group. However, reliability for adults in the upper 25% of the reading level distribution was sufficiently high to allow comparison of the deaf subjects to hearing norms. The preliminary conclusion was that the high-reading deaf students were significantly more externally oriented than hearing norms. Given what we know about relative performances of internals and externals in instructional situations, the implications for the education of the hearing-impaired are clear.

The above finding was supported by Blanton and Nunnally in a set of two studies which employed two different measuring instruments (Blanton & Nunnally, 1964). The first used the Bialer-Cromwell Children's Locus of Control Scale and found that deaf children attributed, to a significantly greater degree than hearing controls, the responsibility for events to external rather than personal or internal causes. The second study employed the Locus of Evaluation Scale in addition to the Bialer-Cromwell Scale and reported consistent findings. The interesting assumption underlying the second study was that hearing-impairment results in relatively little experience with evaluational and affective words. The smaller affective vocabulary of deaf students is presumed to be directly connected to relative immaturity in social-emotional growth, since it is hypothesized that social growth is highly dependent on the use of judgemental affective categories. Therefore, deaf students' dependence on others for the evaluation of performance results in greater externality.

Disabilities

The following five studies relate the general concept of disability to LOC. A variety of physical as well as cognitive disabilities were found to correlate significantly with externality. In comparison with normal controls, disabled groups tend to exhibit a significantly greater degree of external orientation.

Hallahan, Gajar, Cohen and Tarver (1978) employed both the Intellectual Achievement Responsibility Questionnaire (IAR), an academic-specific measure of LOC and the Nowicki-Strickland Scale, a global measure of the same construct. Twenty-eight learning disabled (LD) and 28 normal (matched) teenagers were administered these instruments. LD subjects were significantly more external than the controls, although no relationship was found between the two measures. The multivariate aspect of this finding suggests that the effect of disability on control orientation is even more pervasive than previously suspected.

A second study which also examined the relationship between LOC and learning disabilities is reported by Chapman and Boersma (1979). These investigators also used the IAR. The IAR is believed by some to be an improvement over other scales because it yields two subscores - one for each of positive and negative events. Results indicated that LD subjects were relatively external regarding positive events. However, no difference was observed for negative events. An additional finding, and one that may offer an explanation of the discrepancy, is that LD mothers had more negative and fewer positive reactions to their children, leading perhaps to the child's belief that, if he is successful, it must be because of chance, etc. Similarly, if interaction with the mother tends to produce a sense of intrinsic inferiority in the child, he will likely assume that all failure is attributable to his own deficiency.

In the area of physical disability, Land and Vineberg (1965) compared blind children with sighted controls on LOC. Residential and nonresidential blind children were

examined. The Bialer-Cromwell Scale was employed, and groups were equalized for mental age. Results indicated that blind subjects were more externally-oriented than sighted controls. No difference was found, however, between residential and nonresidential blind subjects.

MacDonald and Hall (1971) investigated attitudes toward various types of disabilities and LOC for a large group of undergraduate students (211 male and 268 female). Disabilities included: 1) internal; 2) sensory; 3) cosmetic; and 4) emotional. The Rotter Scale was employed and results indicated an interaction between LOC and type of disability in terms of ratings of self-impact. Consistent with expectations, externals rated physical disabilities as more debilitating than internals. In contrast, internals rated emotional disorders as being more debilitating relative to physical disabilities.

Finally, Lipp, Kolstoe, and James (1968) investigated physically disabled vs. normal subjects' denials of perceived disabilities as a function of LOC. A major finding was that physically disabled subjects demonstrated extreme difficulty in perceiving slides of disabled persons when contrasted with viewing slides of normal persons. They, in effect, blocked perception of other disabled persons. This result was interpreted as a denial of disability, consistent with findings from other studies. Contrary to the investigators' expectations, external disabled subjects were <u>less</u> denying of their disabilities than internals. This phenomenon was explained in terms of externals' being accustomed to less perceived control and therefore less threatened by the loss of control implied by physical disability.

All of the research we have examined thus far gives us reason to believe that LOC is responsive to a variety of situational features of the instructional process. This being so, we are led to the speculation that LOC may be manipulable in consequence of changes in these features, and, in fact, research suggests that such change is possible.

Changeability

A number of studies have yielded findings which indicate that certain experiences and/or environmental conditions can produce changes in LOC. These findings are consistent with LOC Theory. Foulds (1971) hypothesized that a growth group experience of 8 weekly 4 1/2 hour sessions would increase participants' internality. The sessions were explicitly intended to provide an environment in which acceptance of personal responsibility was encouraged. Thirty undergraduates volunteered to participate in this experimental group while controls were selected from a psychology course. All subjects were administered Rotter's I-E Scale pre and post, although only the experimental group participated in the sessions. The sessions encouraged risk and openness, and "straight talk" was urged. The sensory awareness, nonverbal and psychodrama exercises which made up the largest part of the group experience were performed in a supportive environment. As expected, the experimental group evidenced a significant shift toward internality. No change in LOC was indicated for the control group. This finding must be cautiously interpreted, however, in view of the fact that the experimental subjects were volunteers while the controls were selected. The fact that the experimental subjects had volunteered means that this group already desired change, and the desire for change is a necessary condition of its occurence.

In another study, Nowicki and Barnes (1973) demonstrated that LOC changes may result from a structured camp experience. The Nowicki-Strickland Scale for Children was administered, pre and post. During the week intervening between these administrations inner-city teenagers participated in a structured camp experience. Significant shifts toward internality were observed. Once again, this finding is consistent with other results although the authors note the lack of proper controls.

Several studies have investigated changes in LOC as a function of induced success

and/or failure. The underlying assumption in these studies is that since control orientation is closely linked to performance expectancy, manipulation of success and failure perceptions should result in a shift in orientation.

Problem-solving styles have been characterized along an inner-outer continuum analogous to control orientation. Outer directed problem-solving style is defined in terms of reliance on concrete situational cues, whereas inner directedness is characterized by attempts to deduce abstract relations. It has been demonstrated that manipulating success and failure in problem-solving situations as well as manipulating task cues so that tasks will be perceived by subjects as requiring either internal or external strategies results in a shift in control orientation.

MacMillan and Wright (1974) reported findings which indicate that children's problem-solving styles change on the LOC dimension when the experimental task is preceded by a similar task on which the child performed either successfully or unsuccessfully. Second, fourth, and sixth graders were randomly assigned to success or failure problem-solving conditions, followed by a similar problem-solving task. It was assumed that outer directedness could be inferred from task performance. Greater externally-oriented behavior and perceptions (as adduced from self-report) were observed following failure conditions.

Consistent with this finding, Gorman (1968) reported that 62 undergraduate McCarthy supporters scored extremely high on externality directly following the failure at the 1968 Democratic Convention. Because there are no controls other interpretations may be possible, and caution must be exercised. This finding, however, is consistent with MacMillan and Wright (1974) in terms of the effect of induced failure.

Brecher and Denmark (1972) also reported consistent findings. Of 88 undergraduates who were administered the Rotter I-E scale, 66 were used as controls, and the remaining

22 were assigned to the experimental condition. The experimental condition consisted of strong negative feedback to students concerning their performance on previously (three weeks) administered exam immediately before they completed the I-E scale. The instructor reported to this group that the exams were the worst she had ever seen, that she would not be returning them, and that more than one half of the class had failed with the rest doing poorly. The results indicated significantly greater externality for the experimental group. Once again, perceptions of failure evidently exercised a strong influence on control orientation. Furthermore, the introduction of failure apparently can be sufficient to provide a shift toward externality. Likewise, we should expect that success will be related to a shift in the internal direction.

Two aspects of the findings on induced success/failure are particularly intriguing and suggestive. In the first place, the variables manipulated are unequivocal and easily replicable. Secondly, these findings suggest that an individual's LOC is quite malleable, with relevant precipitative experiences having a predictable effect.

Several studies have examined the effect of salience of structured features in the learning situation which would be expected to produce belief in the availability of internal control. Eisenman (1972) examined the effect of experimental instructions on LOC. College students participated in three verbal conditioning studies wherein they had to guess with which pronoun another student had begun each of 30 sentences. Fifty subjects were told that their "clinical sensitivity" could lead to excellent guesses. Fifty other subjects were told that the correctness of their choices would be purely chance, and that the distribution of their random guesses was under study. A third group of fifty subjects served as controls. All were administered the Rotter I-E Scale, both pre and post. As hypothesized, changes in subjects' LOC occurred in directions congruent with the experimental instructions. The internal (i.e., "clinical sensitivity") instructions increased

internality, while external (i.e., "random") instructions increased externality. No shift was indicated for control subjects.

Pedhazur and Wheeler (1971) reported consistent results. Fifty-three minority children identified as externals read a story which made perceived internal control more salient. Post administration of the Bialer Scale for LOC indicated an increase in internality. While proper controls were lacking and subjects were minority children and hence not representative, the results are nonetheless consistent with other findings.

Johnson and Croft (1975) also revealed similar findings. The relationship between LOC and performance in a personalized system of instruction (PSI) course was the primary focus here. LOC was assessed by Rotter's I-E Scale both pre and post for 179 college students enrolled in a personality course. Standard PSI features were present, such as individual contracting and pacing, explicit structure, and explicitly formulated criteria. Although LOC was not related to course performance, significant change toward internality was observed. The PSI features probably increased the salience of the availability of internal control in a fashion similar to that in the previously discussed studies.

Taken as a set, these studies suggest essentially three conditions which give rise to predictable changes in LOC. The Foulds (1971) study suggests the need for a non-threatening, supportive environment. The findings from the induced success/failure studies are fascinating in their simplicity and adherence to basic principles of learning. It was shown that subjects who experience only failure become more external in their LOC. This makes sense in that each instance of failure can be seen as an extinction trial. The individual's belief in the availability of success and his consequent effort seem to systematically decrease over trials. Conversely, it was shown that internality may be increased by the induction of success. This finding has been interpreted as revealing an opposite side to the failure effect. That is, each instance of success seems to act like a

reinforcement trial, with systematic increments in the individual's belief in internal control appearing over trials. The third condition necessary for change seems to be knowledge of and belief in the availability of internal control. Otherwise stated, subjects must be aware of and believe in the causal relationship between their behaviors and results. Such awareness has been shown to be manipulable by changing environmental cues in such a way that demands for internality become salient.

Simply instructing subjects in these matters would probably not produce shifts, however. The preceding findings do suggest, nevertheless, that specific experiences of short duration can produce predictable shifts in control orientation in either direction along the LOC continuum.

Further study in the changeability of LOC orientation given the demonstrated relationship between achievement performance and LOC is of special interest for instructional research. Such future study will benefit the theoretical elaboration and refinement of the LOC construct as provided by attribution theory.

Amendments and Contributions of Attribution Theory

While the internal-external dichotomy affords a foundation for explaining performance differences in terms of the individual's perception of the dynamics of control, it has been argued to be inadequate as a total account of these differences. In fact, with respect to such phenomena as shifts in expectancy of success following positive affective experiences, the social learning theory construct of locus of control makes predictions in the opposite direction from those that have been substantiated by research grounded in attribution theory. Basically, the reconceptualization of the control construct offered by attribution theory is intended to account for those transient affective experiences, which though transient, nevertheless influence the control orientations of individuals as they

respond to the immediate demands of variously structured situations. Where locus of control as formalized by Rotter refers to a relatively stable dispositional characteristic of individuals, attribution theory suggests 1) that situational features account at least in part for these apparent dispositions, and 2) that contextual variations can account for some of the predictive failures of social learning theory.

In educational research, Bernard Weiner's work has been most influential in recasting the control construct in terms of responsibility attribution. Rather than there being a single question regarding the person's disposition to locate causes either internally or externally, two questions are raised: 1) Is control located internally or externally, and 2) Is the causal explanation provided grounded in stable conditions of either person or environment or is it grounded in some more ephemeral condition of person or environment? Questions for research probe the relationship of these attributions to general motivational and other affectual predispositions and to the effect of contextual manipulations. Weiner argues that reconceptualization of the control construct in line with these kinds of questions can yield a total theory of motivation which will enable us to explain classroom success and failure. By providing such a motivational explanation, he also asserts that it is possible to derive concrete recommendations for classroom practice.

In the process of reconceptualizing the construct, Weiner (1979) argues that "locus of control" is not a single construct. Rather it is to be measured along three axes or dimensions. Causal attributions occur always along these three dimensions, so that causality 1) may be either internal or external to the individual, 2) may be attributed either to stable or to changing conditions (a causal explanation at the unstable end of this axis is not an explanation that will be invoked in dissimilar situations), and 3) a person's intentions may or may not be perceived to affect consequences.

Weiner argues that each of the three dimensions has a primary psychological

connection: stability is connected to and predictive of the magnitude of expectancy of success following success - if a person accustomed to failure achieves success in some situation and attributes it to luck, there is little likelihood that his expectations for future success will be raised; internality is posited to be linked to self-esteem. Since self-esteem is necessary to the preservation of the person's integrity, attribution to external causes is sometimes necessary in the interest of survival; perceived controllability is directly linked to task evaluation. In concrete terms, a success attribution to the internal and stable factor of ability yields feelings of competence which necessarily lead to expectancy of success, positive evaluation of the task and perceptions of control.

The model which Weiner proposes is in terms of a cognition-emotion sequence:

1) An immediate emotional response is generated by an outcome in an achievement situation.
2) This outcome is attributed to some cause.
3) This causal information is processed to form a relatively stable self-perception and a stable set of expectancies.
4) Expectancies for future performance act on performance in future achievement situations.

Weiner concludes that manipulation of classroom settings by providing different emotional experiences can mediate changes in these causal perceptions since the chain is begun with an emotional response.

A series of studies exploring the relationship between causal ascription and affect (Weiner et al. 1972) demonstrated that stable, internal ascriptions increase the tendency for self-reward and self-punishment and that the converse is true of ascriptions to unstable, external factors. In this series of studies it was further demonstrated that

expectancy of success is mediated primarily by the stability of ascription, i.e. expectancy of success is not likely to change immediately for a person who attributes failure to his own relatively stable lack of ability. Concomitantly, ascription of success to internal, stable, and controllable causes (effort) leads to greater self-reward and greater expectancy of success. An interesting conclusion from these studies is that task difficulty (an external and uncontrollable cause) appears to be a salient cue mediating the tendency to expend effort and thereby risk the loss of self-esteem. Tasks of intermediate difficulty seem to elicit the greatest effort expenditure. When this expenditure meets with success, expectancy for future success increases, and immediate effort becomes typical effort.

Clearly the desirable state of affairs would be for persons in achievement situations to ascribe responsibility to their own typical effort and ability. It seems that the way to accomplish this would be to provide students with moderately difficult tasks, or tasks which they can perceive as moderately difficult and to structure the situation so that the outcome will be successful. In terms of the cognition-emotion sequence, this success will elicit a positive emotional response. That response will be attributed to some cause. Now, if a reasonable amount of effort has been expended, that perceived cause will be the effort. That in turn will lead to a perceived connection between the positive emotional state associated with success and effort expenditure, which leads to the prediction of future success given the expenditure of effort, and finally will lead to the actual expenditure of effort which is at least a necessary condition of actual success in fairly structured achievement situations.

As noted at the start of this section, Weiner, Nierenberg, and Goldstein (1976) have argued that social learning theory and attribution theory make contrasting predictions regarding expectancy of success in general. Success experiences were manipulated in a study involving 126 male undergraduates. It was demonstrated that expectancy of success

is related to stability of perceived control but that perceptions of control are not significantly related to either expectancy of success or to numbers of prior successes. What this means is that a person may have a stable attribution of control to task ease, and this will not increase his expectation of future success since we can not always count on tasks to be easy. Nor will a large number of successes which are attributed to external causes increase expectancy of success. However, if one thinks that success and failure are under self control and that this control derives from stable features of self action, then success will be expected in future situations. Success alone is not a sufficient condition to insure expectancy of success although it is a necessary one. The necessary and sufficient conditions for the promotion of expectancies of success are past success combined with attribution to stable, internal, and controllable causes.

A number of studies have investigated the relationship between attribution of causal responsibility to stable, internal, controllable causes, and other characteristics of the person.

Diener and Dweck (1976) provide evidence that response to failure and responsibility attribution differs for helpless children and mastery-oriented children. While mastery-oriented children engage in self-instruction and formulation of remedial strategies, helpless children verbalize that failure is caused by their own lack of ability. They make uncontrollable, stable, internal attributions. Mastery-oriented children, on the other hand, believe in the efficacy of their own effort and thus formulate alternative responses.

A study by Crandall, Katkovsky, and Preston (1962) revealed a high correlation between valuing achievement and internal, stable responsibility attribution. The most important finding in this study was that responsibility attribution is an excellent predictor of achievement behaviors. If, as Weiner claims, it is possible to manipulate responsibility attributions by changing classroom settings to provide positive emotional responses linked

to responsibility, then by implication, it is possible to promote appropriate achievement behaviors.

Ames and Lau (1979) investigated the relationship between student ratings of a course and attribution perceptions and discovered that internality was related to positive course evaluations independently of grade received, while the reverse was true for externals. For externally-oriented students, positive evaluation was always accompanied by a high grade. This finding was corroborated by Stebbins and Stone (1977).

Relationships between success and stable internal attributions were found in a study by Arkin and Maruyama (1979). Students were found to make attributions to others' outcomes that were mirrored to self attributions. Successful students attributed others' outcomes to stable and internal causes as often as they did their own. The reverse was true of unsuccessful students.

In general, success more than failure seems to be attributed to internal factors (Lugenbuhl, Crowe and Kahan, 1975). An interesting study by Simon and Feather (1973) demonstrates that this tendency represents a weighted combination of properties of the person and properties of the task. Simon and Feather discovered that variable and external factors are most likely to be invoked as causes when outcomes violate expectations. Thus, a student who believes himself prepared for an examination and who expends a considerable amount of effort in writing, and yet fails, is likely to attribute his/her failure to an external variable cause such as luck. This could explain the findings reported above, especially when viewed in light of Weiner's suggestion that different settings might provide opportunity for differential attribution formation.

Ames, Ames, and Felker (1977) found that both the affect-laden experience of self-evaluation and the attribution of responsibility for success and failure are highly dependent on whether the reward structure is based on a competitive or a noncompetitive

situation. Differential effects on both self and other judgments were found. In this study, pairs of fifth grade boys solved achievement puzzles in either a cooperative or competitive situation. In the competitive situation, failure was self-punished, strong negative affect was present, and failure subjects felt themselves to be less competent than their partners. Once again, the theoretical framework of attribution theory is confirmed since affect is associated with self-esteem. A primary outcome of this sort of negative experience will be attribution of cause to lack of ability. With repeated occurrences, this will become a stable self-perception, and will lead to depressed expectancy of success, and a decrement in achievement behaviors.

One final study dealing with the effect of situational structure on responsibility attribution was carried out by Phares and Wilson (1972). They found that generalized causal expectancies operate with greater force in situations where the cues are ambiguous. In highly structured situations it was found that the provision of explicit cues depresses individual response tendencies. Where the cues for the appropriate placing of responsibility are ambiguous, however, subjects revert to generalized dispositions.

This approach to the problem of responsibility and motivation appears to be potentially fruitful for classroom purposes. There is hope that if the environment is manipulated in ways that associate positive affective experiences with achievement situations, and if the reward system is structured to capitalize on students' controllable skills and abilities, we should see an increase in the self-esteem and expectancy of competence requisite to actual success.

Summary and Implications

This final section will be restricted to a discussion of the implications of the control construct, particularly as reformulated by attribution theorists, for research and practice in the teaching of hearing-impaired students. We can conclude from our search of the literature that the experienced-based intuitions of NTID faculty are corroborated. Hearing-impaired students do exhibit a relatively greater tendency toward externality, and externality is related to poorer achievement and less effective study habits and attitudes. While conclusions specifically regarding hearing-impaired populations must be qualified in view of the small number of reported studies, it is suggestive that no studies report results contradictory to the conclusion that such students are more likely to exhibit an external orientation. Moreover, despite the limited number of studies relating hearing-impairment to control orientation, there exists a relatively large number of studies that grouped under the rubric of "special populations." The consistency of findings, despite variations of impairments, adds force to the arguments concerning hearing-impaired students.

We can easily understand the reason for this hypothesized greater externality of hearing-impaired students particularly when we take account of the situational contingency of control orientation proposed by attribution theory. In fact, as well as in belief, deaf persons are more dependent on the external world and on powerful others than is a normally hearing person. Not only is such dependency a consequence of the physical handicap itself, it is also promoted by the typical forms of social interaction. Handicapped persons are rewarded for behaviors that would be defined as overly-dependent in a physically normal person. And the hearing-impaired have a special problem even when compared with other handicapped and otherwise disadvantaged populations. Their

isolation from the dominant communicative mode in human communities leaves them more dependent on others for evaluation and judgment of their actions. The one study we discovered dealing with the "locus of evaluation" and its relationship to the range of affective vocabulary encourages us to think that the manipulation of control orientation without attention to situational and affective factors will yield only equivocal results.

We take as our starting point the formulation of LOC given in social learning theory as a relatively stable disposition of persons to regard control over outcomes to either internal or external causes. We conceive of this predisposition as a prime determinant of achievement outcomes. However, the studies within the context of attribution theory and even some studies within the original paradigm lead us to believe that situational and affective characteristics fully cross with and moderate the relatively stable control predisposition. Taking this point of view, we should be able to devise some feasible strategies for investigating LOC at NTID. Consideration of transient affective and situational factors should be ultimately more productive of change than a focus solely on what has been defined as a relatively stable predisposition.

Preliminary study, then, should focus on the investigation of the distribution of the stable predispositional component of locus of control for NTID students. Such a study should include, but not be limited to, the development of a psychometrically sound instrument for assessing LOC among hearing-impaired students. This would form the basis for comparative study.

The proposed instrument would be different from the Rotter Scale and other traditional instruments since its grounding in attribution theory would entail our characterizing the stable component of LOC as a unidimensional characteristic. The reader will recall that social-learning theory researchers concluded in favor of the multidimensionality of the construct. We suspect that the reason for such a conclusion is that traditional

social-learning theory combines the transient and the stable components of control orientation. Since it has been demonstrated that LOC does shift with perception of the demands of environmental cues and transient moods, we propose that the various factors be distinguished in the psychometric instrument. We can speculate that separating transient from stable components under the assumption that these transient components act as moderator variables on the stable predisposition will enable us to investigate the environmental contingencies and affective responses related to fluctuations along the internal-external continuum.

Given this framework, we may formulate some tentative hypotheses regarding NTID students. We may suppose that our psychometric evaluations will support the faculty's hypothesis that NTID students are relatively externally oriented. This orientation we will suppose is pervasive and stable. Simultaneously, we are led to look for features of instructional content and organization that provide cues that provoke external causal perceptions. We would suspect that the stable component will fluctuate with differential perceived demands in the educational situation. Finally, we must suppose that the perception of these cues, that is the degree to which they appear to signal externality or internality, is related to the student's affective response to the situation. This implies that a student high in externality will make <u>more</u> external attributions in a learning situation which is controlled by the teacher, provokes anxiety, and threatens the self-esteem. Conversely, we may expect that this same student, when confronted with cues which demand perception of personal responsibility within a context designed to maximize self-esteem and minimize affective threat, will make (relative to his own predispositional response tendency) <u>fewer</u> external attributions. This, in turn, should provoke greater activity and time on task so as to maximize achievement and a shift toward relative internality.

However, when thinking along the above lines, we must also keep in mind those studies which investigated the instructional relevance of locus of control and demonstrated that congruence between instructional technique and stable personality aspects is critical in achievement. It will not do to simply place an externally-oriented student in an environment which demands personal control. Such a strategy would ultimately prove disastrous because the affective aspect of the interaction between person and environment would be overlooked. Nor will it do simply to match externally-oriented students with learning environments which allow and encourage externality, although such a strategy might initially produce greater achievement effects. What is dictated is an incremental approach where environmental cues demanding internality are gradually introduced within situations that produce positive affect.

Such an approach is consistent with other findings in educational psychology. Aptitude-treatment interactions similarly support a congruence/accomodation model with other nonability measures, such as cognitive style, trait anxiety, and achievement orientation, characteristics which also interact with instructional technique.

In terms of future instructional research, then, one possible direction is an investigation of a series of matching/mismatching studies which would look at such variables in combinatory effect with locus of control. We would expect to find some optimal level of matching which, while producing the requisite positive affect, would also promote change. Multivariate studies of this sort would allow for the testing of other univariate hypotheses as well as provide a ground for testing the conjoint influence of several variables.

Clearly, this approach suggested by attribution theory impacts most forcefully on the issue of changeability of perceived locus of control. Strategies which simply manipulate task outcomes will necessarily yield only equivocal results when pervasive and

relatively stable change in perception is desired, since such strategies do not and cannot take account of the demonstrated crucial aspects of learner expectation, perceived effort, and self-integrity. A simple input-output model neglects the actual responsibility students do have for their own learning, and places the entire responsibility on the educator. In the final analysis, if such strategies did produce reported shifts in perception, in reality the learner would be totally dependent on environmental manipulation and the whims of happenstance.

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APPENDIX A

THE FOUNDATION SERIES

AN INTERNAL REVIEW OF THE DOWALIBY AND PEGANO PAPER;

Locus of Control:
Review and Implications for Instruction of the
Hearing-Impaired

BY

Jeff Porter

Division of Human Development

NTID/RIT

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INTRODUCTION

Rotter's (1954) social learning theory explains the occurrence of behavior in terms of: (1) the expectancy that behavior leads to a given reinforcement, (2) the value of such reinforcement, and (3) the situational influence upon (1) and (2). The concept of locus of control (Rotter, Seaman, and Liverant, 1962; Rotter, 1966) was developed to further refine this explanatory system.

Locus of control refers to a person's generalized belief or expectancy about the degree of contingency between outcomes of behavior and behavior itself. At issue is not simply a person's experience of successful and unsuccessful outcomes. Rather, the concept characterizes the way in which a person typically interprets the causes of these outcomes (Lefcourt, 1976).

In theory, a person with an internal locus of control perceives the outcomes of behavior as causally related to skills, effort and personal characteristics. A person with an external locus of control perceives behavioral outcomes as dependent not on skills or personal dispositions, but on chance, fate, or the power of others.

Rotter (1966) has hypothesized the existence of consistent individual differences regarding the degree to which persons generally perceive causality between behavior and outcomes in a given situation. This hypothesis has been supported over the years by a great deal of research which confirms the existence of individual differences in perceived locus of control and relates these differences to various qualities of human behavior.

In their Foundation paper on locus of control, Fred Dowaliby and Jo Anne Pegano provide a comprehensive literature review on different aspects of the construct, and an insightful analysis of the instructional implications of the construct for hearing-impaired

students. A brief summary of their literature review is presented next, followed by a listing of some of the important issues for NTID which flow from their analysis of instructional implications.

SUMMARY OF LITERATURE REVIEW

Dimensionality

Numerous studies have focussed on the dimensionality of the locus of control construct, with mixed results. The construct does not appear to be multidimensional, but the number of emergent dimensions varies from study to study depending on such factors as instrumentation format and sex of the respondents. There is some support for a general distinction between the dimensions of "control over personal events" and "control over public events," but the only common finding among all reported studies is that indeed individuals are characterized according to whether they view behavior and outcomes as causally related or as related only by chance, fate, or the influence of powerful others.

Correlates

Dowaliby and Pegano review studies which have explored the relation among locus of control and a host of other instructionally relevant variables, including trait anxiety, cognitive field dependence/independence, "mental ability," verbal abstraction, creativity, and study habits and attitudes. The studies reviewed all point to the same general conclusion; compared to persons of an internal orientation, persons of an external orientation are more likely to have debilitating anxiety reactions, be field-dependent, be lower in mental ability, verbal abstraction, and creativity, and have less effective study habits and attitudes.

Instruction

The studies reviewed in this section of the paper focus on the relation between locus of control and various instructional outcomes. Two important conclusions are generated based on this review: (1) persons of an internal orientation consistently outperform those of an external orientation in measures of academic achievement, (2) a person's locus of control orientation can interact with structural properties of the learning situation in influencing learning outcomes, such that internals maximize their performance in instructional environments low in either structure, discipline, or faculty control, while externals maximize their performance in opposite types of instructional environments.

Deafness

Three studies pertaining directly to deafness and locus of control are reviewed in this section of the paper. Dowaliby and Pegano point out the linguistic complications inherent in assessing locus of control for deaf individuals, and which inherently limit the validity of this type of study. With this basic limitation in mind, the authors note the general finding of an external locus of control orientation among deaf individuals.

Disabilities

Dowaliby and Pegano go on to review studies which relate different types of disability (e.g., LD, blindness) to locus of control. The reviewed studies support the general conclusion that, in comparison with non-disabled controls, disabled groups tend to exhibit a significantly greater degree of external orientation.

Changeability

A series of studies reviewed by Dowaliby and Pegano demonstrate that certain

experiences and/or environmental conditions can foster changes in individuals' locus of control. Providing a supportive, non-threatening environment where risk-taking, openness, and "straight-talk" are encouraged has been shown to increase internality in participating individuals, as has modifying certain features of an environment to make more salient a belief in the availability of internal control. Changes in locus of control toward externality have been found in conditions/experiences of either induced or real failure. In all, the studies in this section suggest an individual's locus of control can be quite changeable, depending on the nature and salience of various situational characteristics. What is not clear from the reported studies in the durability of such change.

Amendments and Contributions of Attribution Theory

Dowaliby and Pegano provide extensive review of concepts and studies in the area of attribution theory which serve to reconceptualize and refine the locus of control construct. The work of Bernard Weiner and others is heavily drawn upon in recasting the locus of control construct from one which emphasizes generalized personal dispositions to one which emphasizes more situationally determined, transient dynamics. Within an attributional analysis of locus of control, two key questions are asked: (1) Is control located internally or externally? and (2) Is the causal explanation based on either stable conditions of the person or environment, or more ephemeral conditions of the person or environment? A model by Weiner is reviewed which posits a cognitive-affective sequence underlying attributions of control. The model explicitly provides for mediated changes in causal attributions within classroom settings through manipulating the nature of affective experiences within such settings.

Following this theoretical introduction, a series of studies from the literature on attribution theory are reviewed which generate some interesting and instructionally

relevant findings, among them being:

- the influence of task difficulty (an external, uncontrollable cause) on effort expenditure (an internal, controllable cause), with tasks of intermediate difficulty eliciting the greatest effort expenditure,
- the relation between task success and expectancy of success, with expectancy of success being based not only on past success but also on the causal attribution of past success to internal, stable, and controllable causes, and
- the difference between "helpless" and "mastery-oriented" children in their causal attributions when encountering failure, with helpless children tending to make uncontrollable, stable, internal attributions and mastery-oriented children tending to believe in the efficacy of effort and therefore engaging in alternative responses.

In general, Dowaliby and Pegano view this recasting of the locus of control construct in terms of attribution theory as an educationally fertile approach. The relatively transient, situationally determined view of this construct within attribution theory allows for greater environmental control over the dynamics of causal attribution.

INSTRUCTIONAL ISSUES FOR NTID/RIT

In the final section of their paper, Dowaliby and Pegano provide solid, penetrating discussion of the implications of the locus of control construct for NTID/RIT as an educational institution. Numerous issues are raised and explored, including needed psychometric revisions in the assessment instrument, possible reasons for the measured and observed tendency of hearing-impaired individuals to be relatively external in their orientation, and an instructional strategy for productively accommodating either the external or internal orientation of a student within a learning situation while at the same time structuring the learning setting in a way which encourages the student to adopt a progressively internal orientation.

For the sake of adding fuel to the needed debate over the relevance and implications of the locus of control construction for the mission of NTID, I conclude this review with a

set of open-ended issues for your discussion and critical examination. These issues complement those raised by Dowaliby and Pegano, and help to define the boundaries of needed analysis prior to reasoned action.

Instrumental Issues

1. How valid is generalizing locus of control findings regarding hearing individuals to the population of hearing-impaired individuals (given the complications inherent in assessing and comparing individuals with such different experiential foundations, language modes, and cultural dynamics)?

2. Beyond the methodological quandry of #1, are we as an educational institution prepared to make the bold value assertion that an internal locus of control is <u>better</u> than an external locus of control, and proceed to claim the fostering of internality as an explicit educational goal?

3. If the answer to #2 is in the affirmative, what is our course of action, both from the empirical/research perspective and from the educational/action perspective? Does activity within the latter perspective need to await empirically supported findings from the former perspective?

4. With regard to this theoretical abstraction known as the locus of control construct, if indeed NTID claims the fostering of internality among its students as an explicit educational goal, what are some concrete means of enlivening this abstraction in the day-to-day interactions among students, faculty and staff (from the "halls" of admissions to the "shores" of graduation, from the residential domain to classroom labs)? What is already being done? What could be done?

5. Aside from fostering in students a perceived sense of contingency between one's behavior and the outcomes of one's behavior (i.e., a sense of personal responsibility for behavior), does the additional educational goal of fostering in students a sense of how to generate meaningful, realistic goals based on self-assessed needs/strengths make any sense? Are both concerns really the same thing? Are they inextricably linked?

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